



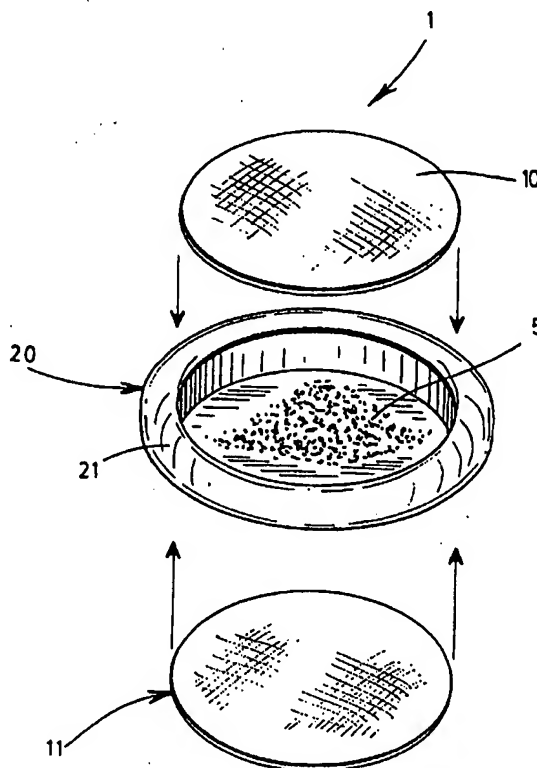
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> : <b>A47J 31/06, B65D 81/00</b>	<b>A1</b>	(11) International Publication Number: <b>WO 00/51478</b> (43) International Publication Date: 8 September 2000 (08.09.00)
<p>(21) International Application Number: PCT/CA00/00214</p> <p>(22) International Filing Date: 1 March 2000 (01.03.00)</p> <p>(30) Priority Data: 60/122,387 2 March 1999 (02.03.99) US</p> <p>(71) Applicant: CONSULTATION YVES BARON INC. [CA/CA]; Suite 200, 2355 Dalton, Sainte-Foy, Québec G1P 3S3 (CA).</p> <p>(72) Inventor: BARON, Yves; 2875 Du Levant, Sainte-Foy, Québec G1W 2H6 (CA).</p> <p>(74) Agent: ROBIC; 55, St-Jacques, Montréal, Québec H2Y 3X2 (CA).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> With international search report.</p>

(54) Title: DISPOSABLE FILTER CARTRIDGE FOR COFFEE OR THE LIKE

## (57) Abstract

A disposable filter cartridge (1) for use in a hot beverage machine. The cartridge (1) comprises two spaced apart layers of porous filter material (10, 11) secured to a rigid or semi-rigid ring-shaped support (20) within which is contained the substance (5) to be infused. The cartridge (1) may further comprise internal separators (32, 33) extending inside the support (20) for dispersing the infusing substance (20) more equally within the cartridge (1) and for providing a more solid cartridge (1). The cartridge (1) is particularly useful to allow a user to prepare a hot beverage using an automated vending machine from a selection of infusing substances such as coffee flavors. The invention also encompasses a method to prepare a hot beverage using such cartridge (1) and a specially adapted machine for using the cartridge (1).



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

**DISPOSABLE FILTER CARTRIDGE FOR COFFEE OR THE LIKE****BACKGROUND OF THE INVENTION**5    **a)    Field of the invention**

The present invention relates to a disposable filter cartridge for use in a coffee vending machine like those found in offices or similar locations.

10   **b)    Brief description of the prior art**

Commercial automated coffee machines such as the ones described in U.S. patents Nos. 5,237,911 and 5,255,593 are well known in the art. The maintenance of such machines is a laborious job since they have a coffee distributor which requires frequent cleaning. These coffee machines must also be  
15   filled regularly with fresh coffee and regularly provided with rolls of filter paper.

It is also known in the art to provide packs of coffee or tea consisting of two layers of perforated paper between which a given amount of the substance to  
20   infuse is kept (see for example U.S. patent No. 5,298,267). The periphery of the two layers is glued or otherwise fastened together by a method like the one described in U.S. patent No. 5,012,629. However, this kind of packs are not sufficiently though for use in automated coffee vending machines because in such machine the infusion process is accelerated by means of a piston which forces  
25   water in and out of the filter before being poured into the cup.

Also known is U.S. patent No. 4,052,318 which describes a reusable coffee filter for use with home coffee makers. The filter has two layers of filter material spaced apart and connected together with securing means. In  
30   contradistinction with the present invention, this filter is reusable and the substance to be infused is deposited upper both layers of filter material.

Accordingly, there is a need for a disposable filter cartridge for use in a hot beverage machine, and particularly commercial automated coffee vending machine. This cartridge must be devised to be easily insertable into a  
5 corresponding receptacle of the machine and capable of withstanding the pressure caused by the piston of the machine. The cartridge must also be cheap to manufacture in order to be disposable.

There is also a need for a beverage machine, such as a commercial  
10 coffee machine, devoid of any coffee distributor and paper rolls, thereby requiring a minimum of maintenance.

The present invention fulfils these needs and also other needs which will be apparent to those skilled in the art upon reading the following specification.

15

### SUMMARY OF THE INVENTION

The object of the present invention is to provide a disposable filter cartridge which satisfies the above needs.

20

The filter cartridge according to the invention has two spaced apart layers of porous filter material which are connected to a rigid or semi-rigid support and used as a container for infusing substance.

25 More particularly, the invention provides a disposable infusing substance filter cartridge for use in a hot beverage machine, comprising:

- a hollow rigid or semi-rigid support;
- a pair of spaced apart layers of porous filter material each having a peripheral portion secured to the support; and
- 30 - an infusing substance contained between the pair of filter layers within the support.

Advantageously, the support defines a closed loop having upper and lower edges on which the peripheral portions of the spaced apart layers are respectively secured. The support is preferably of a square or circular configuration and made of plastic or cardboard.

5

It is also an object of the invention to provide a disposable filter cartridge as described hereinbefore, which further comprises scattering means extending within the support between the layers of filter material for dispersing said infusion material within the cartridge and/or further solidifying the cartridge. Preferably, the scattering means comprise at least one internal separator extending transversely from opposite sides within the support. This(these) internal separator(s) has(have) a height substantially similar to the height of the support corresponding to the distance between the layers of filter material.

15

It is further another object of the invention to provide a method to prepare a hot beverage, comprising the steps of:

- 1) inserting into a specially adapted hot beverage machine a filter cartridge according to the present invention;
- 2) infusing the infusion substance contained in the cartridge with hot water; and
- 3) recovering the hot water infused through said cartridge.

20

It is further an object of the invention to provide a hot beverage machine specially adapted for use with a disposable filter cartridge according to the present invention. The hot beverage machine according to the invention comprises a sliding tray having a receptacle adapted to receive the filter cartridge of the invention and an infusion chamber shaped to receive and infuse the filter cartridge with hot water once the cartridge has been slid into the machine.

25

Others objects and advantages of the present invention will become apparent upon reading the following non-restrictive detailed description of

30

preferred embodiments thereof made with reference to the accompanying drawings.

## DESCRIPTION OF THE FIGURES

5

Figure 1 is a perspective view of the disposable cartridge according to a preferred embodiment of the invention.

10

Figure 2 is an exploded perspective view of the cartridge shown in Figure 1.

15

Figure 3 is an exploded perspective view of a variant of the cartridge shown in Figure 1, comprising scattering means for dispersing the infusing substance within the cartridge and for providing a more solid cartridge.

Figure 4 is a perspective view of a portion of a hot beverage machine adapted to receive filter cartridges like the one shown in Figures 1 and 3.

## DETAILED DESCRIPTION OF THE INVENTION

20

As shown in Figures 1 and 2, the filter cartridge 1 comprises two spaced apart layers of porous filter material 10, 11 which are both connected to a rigid or semi-rigid ring-shaped support 20. An infusing substance 5 is contained between the pair of layers 10, 11 within the support 20. As shown, the support 20 preferably defines a closed loop 21 having upper and lower edges on which the peripheral portions of the layers 10, 11 are respectively secured.

25

As aforesaid, the support 20 is made of a rigid or semi-rigid material. Preferably, this material can be a plastic material, a polymer, a cardboard, a rigid or semi-rigid paper, or of any other suitable non-toxic material. The support 20 must be sufficiently rigid to not bend too easily when manipulated by the user and not break up during infusion in the machine. Although the support 20 shown in Figures 1 and 2 is circular in shape, it could also be square, hexagonal or of any

30

other configuration thereby providing a cartridge having a circular, square, hexagonal or any other suitable configuration. More preferably, the support is made of molded plastic, it has a half-moon cross-section and it is shaped as a circular ring (See Figures 1 to 3).

5

Advantageously, the layers of porous filter material 10, 11 are made of cellulose, nylon, polyester or of any other suitable non-toxic material well known in the coffee and tea industry. These layers 10, 11 must be sufficiently resistant to not tear apart when manipulated and infused with hot water. The same apply to  
10 the way the layers 10, 11 are secured to the support 20 since it is important that the infusing substance (grounds of coffee for example) do not leak out the cartridge 1 before and during the infusion procedure. Although the peripheral portion of the layers 10, 11 is preferably glued to a corresponding edge of the support 20, it may exist other suitable ways to secure the layers 10, 11 to the  
15 support 20. For example, the layers could be clipped to the support 20 with suitable means and/or shaped to define a unitary bag enclosing entirely the support 20.

According to a preferred embodiment of the invention shown in Figure 3,  
20 the cartridge may further comprise scattering means 30 extending within the support, between the two layers of filter material 10, 11. The scattering means 30 permit to disperse the infusing substance 5 more equally within the cartridge 1 and/or solidify the cartridge 1. The dispersion of the infusing substance also permits a better infusion and, accordingly, gives a beverage having a better taste.

25

In the preferred embodiment illustrated in Figure 3, the scattering means 30 comprise two separators 32, 33 forming interior walls extending transversely from opposite sides of the support 20. These separators 32, 33 preferably have a height substantially similar to the height of the support 20 which corresponds to  
30 the distance between the two layers 10, 11. The separators 32, 33 are preferably made of plastic and cast with the support 20. However, separators 32, 33 could be made of any other suitable rigid or semi-rigid material such as paperboard. A

person skilled in the art can appreciate that the separators 32, 33 solidify the cartridge and also further hold the layers of filter material 10, 11 thereby preventing the tearing of the layers 10, 11 during the infusion. More preferably, the layers 10, 11 are glued to the separators 32, 33. Although the scattering means  
5 illustrated in Figure 3 have an X configuration partitioning in four parts the infusing substance, other configurations such as Y and star (\*) like configurations are also suitable according to the present invention.

The filter cartridge 1 according to the present invention is particularly  
10 useful to allow a user to prepare easily and rapidly a hot beverage of its choice. For example, the filter cartridge 1 may be individually sold such that a user could choose from a selection of various infusing substances (coffee favors for example).

15 After having selected its cartridge, the user would insert the cartridge 1 into a corresponding location of a specially adapted beverage machine 100 as the one shown partially in Figure 4. The specially adapted beverage machine 100 according to the invention is preferably a commercial automated coffee machine which has been modified to comprise a sliding tray 110 having a receptacle 120  
20 adapted to receive the cartridge 1. In use, the tray 110 is pushed to slide the cartridge 1 into an infusion chamber 130. The user then presses button(s) to select the infusion time and the quantity of water such that hot water is poured into the chamber 130 over the inserted cartridge 1. The infused hot water having been flavored by passing through the cartridge 1 is recovered at an outlet 140 of the  
25 chamber 130. Although not shown, the tray 110 and the machine 100 are further preferably adapted such that the used cartridge having been infused is ejected into a waste container when another user pulls the tray 110.

As can be appreciated, the use of a cartridge 1 according to the invention  
30 avoid the presence of a coffee distributor inside the coffee machine 100, a great advantage since the maintenance of such distributor is a laborious job. Coffee machines having a coffee distributor must be cleaned very often, they must be

filled regularly with fresh coffee and regularly provided with new rolls of filter material. The beverage machine according to the invention is devoid of these elements, reducing to a minimum the maintenance of the coffee machine.

5           Although not illustrated, home coffee makers could also be easily adapted for using the cartridge of the invention. For example, the cone-shaped basket of common coffee makers could be replaced by a tray having a receptacle shaped to receive the cartridge 1 of the invention.

10           While several embodiments of the invention have been described, it will be understood that the present invention is capable of further modifications, and this application is intended to cover any variations, uses, or adaptations of the invention, following in general the principles of the invention and including such departures from the present disclosure as to come within knowledge or customary  
15           practice in the art to which the invention pertains, and as may be applied to the essential features hereinbefore set forth and falling within the scope of the invention or the limits of the appended claims.

**CLAIMS:**

1. A disposable infusing substance filter cartridge (1) for use in a hot beverage machine to prepare a hot beverage, characterized in that it comprises:
  - 5 - a rigid or semi-rigid ring-shaped support (20);
  - a pair of spaced apart layers of porous filter material (10, 11) each having a peripheral portion secured to the support (20); and
  - an infusing substance (5) contained between the pair of filter layers (10, 11) within the support (20).
- 10 2. The disposable filter cartridge (1) of claim 1, characterized in that the support (20) defines a closed loop (21) having upper and lower edges on which the peripheral portions of the spaced apart layers (10, 11) are respectively secured.
- 15 3. The disposable filter cartridge (1) of claim 1 or 2, characterized in that the support (20) has a square or circular configuration, thereby providing a square or circular cartridge (1).
- 20 4. The disposable filter cartridge (1) according to any one of claims 1 to 3, characterized in that the support (20) is made of a material selected from the group consisting of plastic, polymer, cardboard, and paper.
- 25 5. The disposable filter cartridge (1) according to any one of claims 1 to 4, characterized in that at least one of said pair of layers of filter material (10, 11) is made of a material selected from the group consisting of cellulose, nylon, and polyester.
- 30 6. The disposable cartridge (1) according to any one of claims 1 to 5, characterized in that the layers of filter material (10, 11) are glued to the support (20).

7. The disposable filter cartridge (1) according to any one of claims 1 to 6, further comprising scattering means (30) extending within the support (20) between the layers of filter material (10, 11) for dispersing said infusing substance (5) within the cartridge (1) and for further solidifying the cartridge (1).
- 5 8. The disposable filter cartridge (1) according to claim 7, characterized in that the scattering means (30) comprise at least one internal separator (32) for partitioning in at least two parts the infusing substance (5) within the cartridge (1).
- 10 9. The disposable filter cartridge (1) according to claim 7 or 8, characterized in that the scattering means (30) comprise at least one internal wall extending transversely from opposite sides within the support (20), said internal wall having a height substantially similar to the height of the support corresponding to the distance between the layers of filter material (10, 11).
- 15 10. The disposable filter cartridge (1) according to claim 9, characterized in that said at least one internal wall is secured to the support (20) and/or to the layers of filter material (10, 11).
- 20 11. The filter cartridge (1) according to any one of claims 7 to 10, characterized in that the scattering means (30) have a Y, an X or a star configuration.
12. The disposable filter cartridge (1) according to any one of claims 1 to 11, characterized in that the infusing substance (5) is selected from the group
- 25 consisting of ground coffee, tea and herbal tea.
13. A method to prepare a hot beverage comprising the steps of:
- 1) inserting into a specially adapted hot beverage machine (100) a disposable filter cartridge (1) according to any one of claims 1 to 12;
- 30 2) infusing the substance contained in said cartridge (1) with hot water; and
- 3) recovering the hot water infused through said cartridge (1).

14. A hot beverage machine (100) for use with a disposable filter cartridge (1) according to any one of claims 1 to 12.
- 5 15. The hot beverage machine (100) according to claim 14, characterized in that it comprises:
- a sliding tray (110) having a receptacle (120) adapted to receive said filter cartridge (1); and
  - an infusion chamber (130) shaped to receive and infuse the filter cartridge (1)
- 10 with hot water once said filter cartridge (1) has been slid into the hot beverage machine (100).
16. The hot beverage machine (100) of claim 15, characterized in that said machine is a commercial coin vending machine.

15

1 / 3

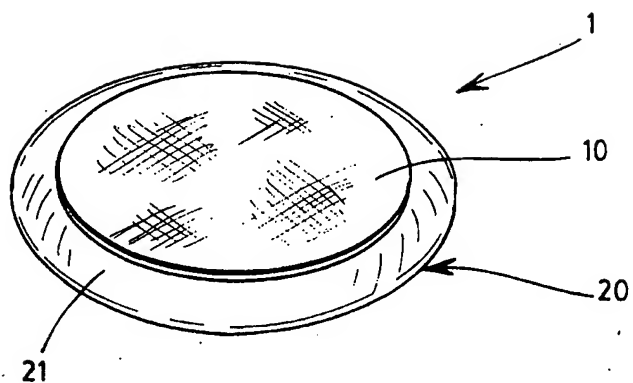


FIG. 1

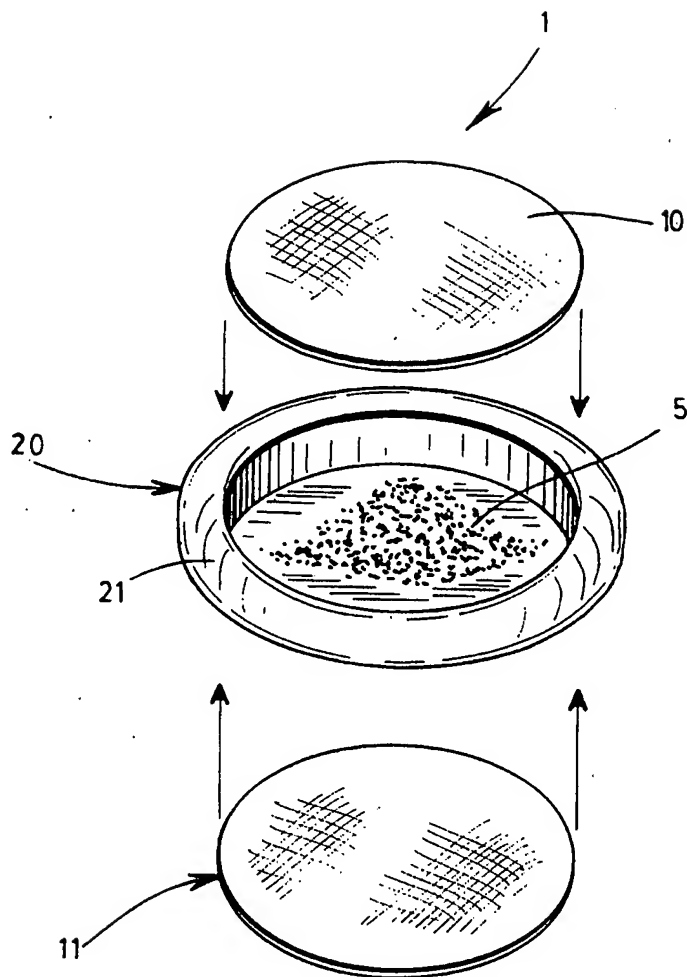
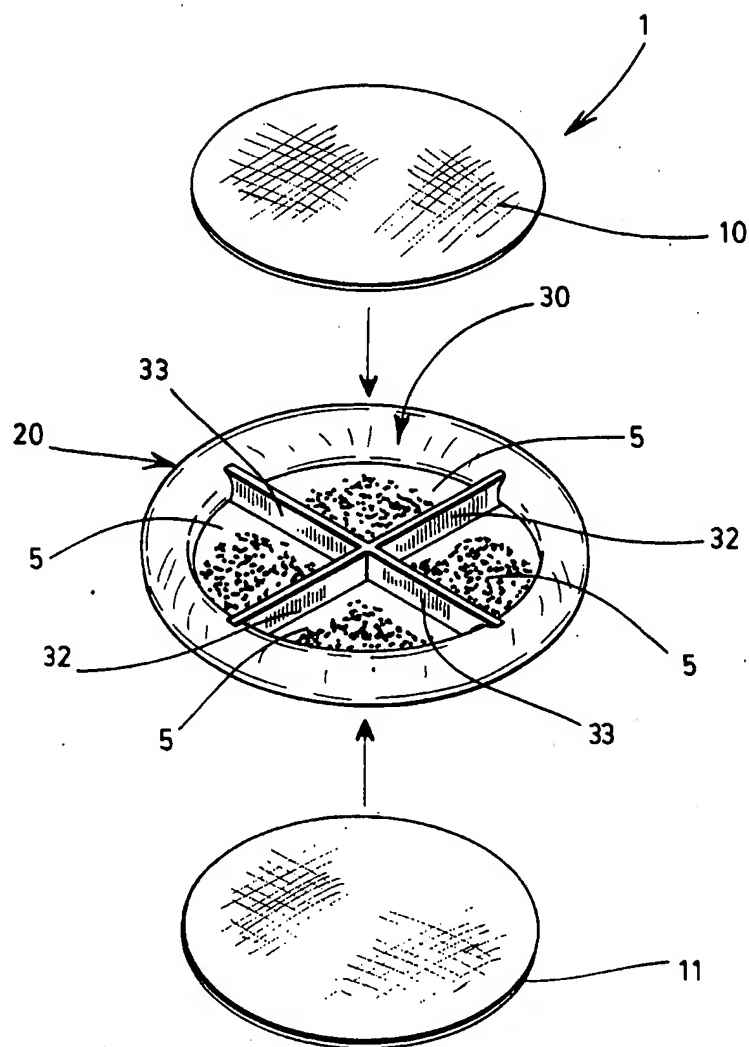


FIG. 2

2 / 3

FIG. 3

3 / 3

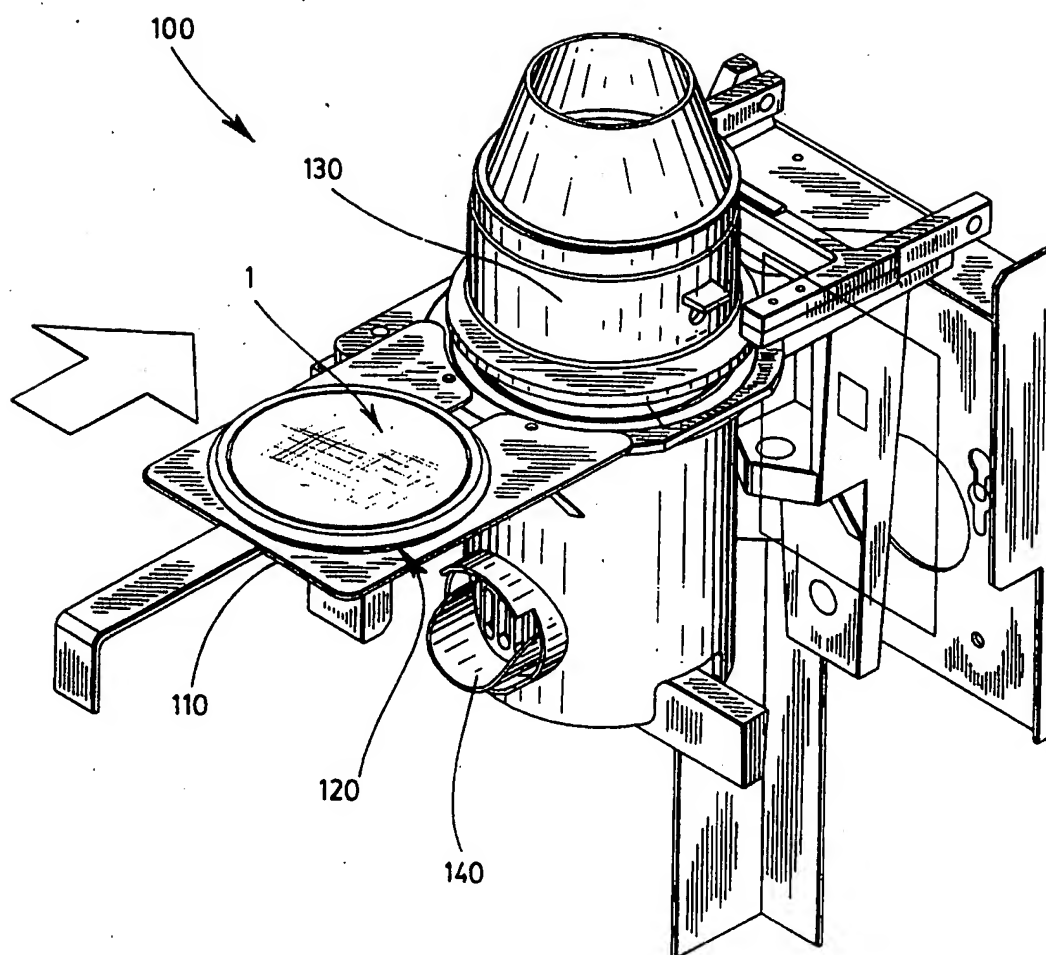


FIG. 4

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00214

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 A47J31/06 B65D81/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A47J B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 398 530 A (HAG GF AG) 22 November 1990 (1990-11-22) page 3, line 41 -page 4, line 29; figures 1-4	1-14
Y	---	15,16
Y	DE 36 44 947 A (GESEN) 7 April 1988 (1988-04-07) column 4, line 46 -column 5, line 33; figures 2,3	15,16
X	EP 0 615 714 A (GENERAL FOODS LTD) 21 September 1994 (1994-09-21) column 7, line 14 - line 39; figures 7B,7C	1-6, 12-14
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "A" document member of the same patent family

Date of the actual completion of the international search

6 June 2000

Date of mailing of the international search report

13/06/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Bodart, P

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 00/00214

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 361 569 A (SAS) 4 April 1990 (1990-04-04) column 2, line 22 -column 3, line 45; figures 2,3 -----	1-6, 12-14
A	US 4 471 689 A (PIANA) 18 September 1984 (1984-09-18) column 2, line 66 -column 3, line 48; figures 1,3 -----	7-11

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

# INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/CA 00/00214

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 398530 A	22-11-1990	US 4996066 A CA 2015280 A JP 3004817 A NO 902134 A	26-02-1991 15-11-1990 10-01-1991 16-11-1990
DE 3644947 A	07-04-1988	DE 3613119 A EP 0249700 A	26-11-1987 23-12-1987
EP 615714 A	21-09-1994	AU 5766094 A CA 2119179 A JP 6319645 A	22-09-1994 18-09-1994 22-11-1994
EP 361569 A	04-04-1990	BE 1002512 A	05-03-1991
US 4471689 A	18-09-1984	IT 1210982 B AT 10160 T DE 3261150 D EP 0057671 A	29-09-1989 15-11-1984 13-12-1984 11-08-1982